



# Source Water Assessment Program (SWAP) Report For MIT Haystack Observatory

## What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

## SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource  
Protection,  
Drinking Water Program

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**Table 1: Public Water System (PWS) Information**

|                      |                          |
|----------------------|--------------------------|
| <i>PWS NAME</i>      | MIT Haystack Observatory |
| <i>PWS Address</i>   | Route 40                 |
| <i>City/Town</i>     | Tyngsboro, Massachusetts |
| <i>PWS ID Number</i> | 2301023                  |
| <i>Local Contact</i> | Savas Danos              |
| <i>Phone Number</i>  | (978) 486-3104           |

| <i>Well Name</i> | <i>Source ID#</i> | <i>Zone I<br/>(in feet)</i> | <i>IWPA<br/>(in feet)</i> | <i>Source<br/>Susceptibility</i> |
|------------------|-------------------|-----------------------------|---------------------------|----------------------------------|
| Well #1          | 2301023-01G       | 149                         | 441                       | Moderate                         |

## Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

## 1. Description of the Water System

The well for the facility is located on the premises. The well has a Zone I of 149 feet and an Interim Wellhead Protection Area (IWPA) of 441 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

## 2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) With Heating Oil;**
3. **Septic system within the IWPA; and**
4. **Research laboratory.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of only moderate threat land uses or activities in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the building, access road, floor drains for blow down water and parking areas. The public water supplier owns and controls all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

#### Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the observatory plans to continue to use the parking areas, road and buildings within the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

2. **Aboveground Storage Tank (AST)** – There is an AST located on the concrete floor in the boiler room. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

#### Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper

**Table 2: Table of Activities within the Water Supply Protection Areas**

| Potential Contaminant Sources | Zone I | IWPA    | Threat   | Comments   |
|-------------------------------|--------|---------|----------|--|
| Parking spaces, access road   | Yes    | Yes     | Moderate | Limit road salt usage and provide drainage away from wells     |
| Septic System                 | No     | Well #3 | Moderate | See septic system brochure                                     |
| Fuel Storage Above Ground     | Yes    | Yes     | Moderate | Tank is on broken pavement, should be on an impervious surface |
| Research laboratory           | Yes    | Yes     | Moderate |  |
| Structures                    | Yes    | Yes     | -        | Non-water supply structures in Zone I                          |

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Research laboratory** - The facility belongs to MIT, and is used as a research facility. Improper handling or disposal of any chemicals used is a potential source of contamination.

**Recommendation:**

- ✓ Use BMPs for the proper handling, storage, and disposal of chemicals used at the research facility.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

## 3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. MIT Haystack should review and adopt the key recommendations above and the following:

### Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

### Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator.
- ✓ Post drinking water protection area signs at key visibility locations.

### Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials.

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property. .
- ✓ Bring the floor drain into compliance with DEP Regulations (refer to attachment "Industrial Floor Drain Brochure").
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Identify the discharge point of the floor drains.

### Planning:

- ✓ Work with local officials in Tyngsboro, Westford and Groton to include the MIT Haystack IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional

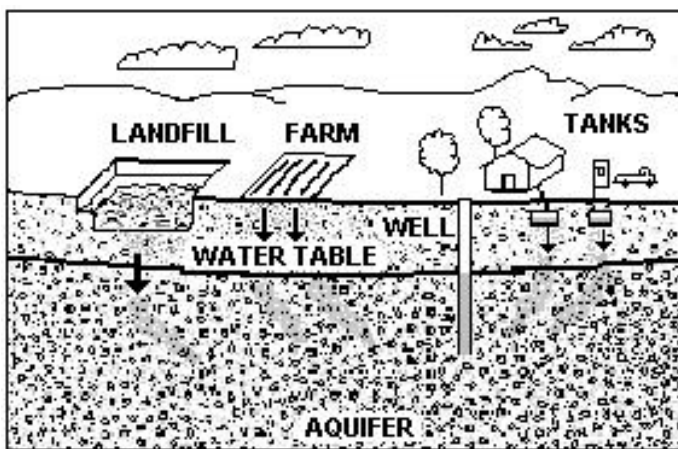


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### **For More Information:**

Contact **Josephine Yemoh-Ndi** in DEP's **Worcester Office** at **(508) 792-7650 x 5030** for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

[www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/)

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

## **4. Attachments**

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Source Protection Sign Order Form

### **Additional Documents:**

To help with source protection efforts, more information is available by request or online at [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/), including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

